Assessing Abnormalities in Spatial Awareness of Patients With Alzheimer's Disease Through the Line Quadrisection Test

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Alzheimer’s disease (AD) is a neurodegenerative disease affecting 50 million people around the world, characterized by brain atrophy, memory loss, and cognitive decline. While much has been researched about the neuropathology and cognitive decline of AD, the motor symptoms of AD received less attention. Previous studies which have conducted the Line Bisection Test (LBT) on AD patients failed to identify abnormal results. In this study, I aimed to determine if AD patients’ bilateral temporoparietal damage can be detected through the Line Quadrisection Test (LQT), a novel test I have modified from the Line Bisection Test (LBT). In the LQT, participants are required to mark a vertical line's ¼, ½, and ¾ positions. I conducted the LQT on 50 AD patients and 50 normal controls. When marking the ¼ and ¾ points, AD patients deviated more laterally than normal people but showed normal results on the bisection task (1/2 point). When quadrisecting the lines, the participants’ attentional focus shifts to each end, and the reduced spatial awareness of AD patients caused a more drastic deviation. Thus, this study reveals that LQT detects the spatial abnormalities of AD patients and can be used as a simple but effective tool to diagnose AD in advance. While current diagnostic measures like MRI and PET are too costly, the LQT can indicate the possibility of AD in a faster and more affordable way.

Awards Won:

Second Award of $2,000

American Psychological Association: Complimentary student affiliate memberships

American Psychological Association: First Award of $1,500

The Potamkin Prize for Students: First Award